

REMARKS

Applicant respectfully requests reconsideration. Claims 1-10, 12, 14-16, 20, 23-25, 27, 30, 38, 91 and 92 were previously pending in this application. By this amendment, claims 38, 91 and 92 are being canceled without prejudice or disclaimer. By this amendment, independent claim 1 is being amended. As a result, claims 1-10, 12, 14-16, 20, 23-25, 27 and 30 are pending for examination with claim 1 being an independent claim. No new matter has been added.

Rejections under 35 U.S.C. §103(a)

Independent claim 1 stands rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,409,722 to Hoey et al. (hereinafter, “Hoey”) in view of “A Three-Dimensional Finite Element Model of Radiofrequency Ablation with Blood Flow and its Experimental Validation to Jain et al. (hereinafter, “Jain”) and “Noncontact Radio-Frequency Ablation for Obtaining Deeper Lesions” to Zhang et al (hereinafter, “Zhang”).

The Office Action applies Hoey as a primary reference and correctly states that Hoey fails to teach use of a signal related to the distance of an electrode from tissue as part of feedback data to control energy output of an RF ablation device. The Office Action also correctly states that Hoey fails to disclose the use of blood flow as a feedback signal.

According to the Office Action, Zhang teaches varying output parameters based on fluid flow rate and the distance of an electrode from a tissue (page 3, lines 18-20 of Office Action mailed March 25, 2010). Applicants respectfully disagree. Zhang does not teach varying output parameters based on fluid flow rate and the distance of an electrode from a tissue. Instead, for non-contact ablation, Zhang uses a delivered power of 120 W with a duration of 120 seconds (see page 221, lines 23-28), and does not disclose setting or varying the electrode power or duration based on distance or flow rate. Claim 1 recites selecting a value for an operating parameter for supplying energy to the ablation electrode as a function of first, second and third signals, with the third signal representing a value of a positive distance from an ablation electrode surface that is not in contact with tissue to a target tissue surface. Because Zhang does not teach selecting an operating parameter for supplying energy to an ablation electrode based on distance of the ablation electrode from a tissue surface, withdrawal of the rejection of claim 1 is respectfully requested.

The Office Action also contends that it would have been an obvious modification of the Hoey system to provide the spacing of the electrode from the tissue as an input to a controller to control output parameters of the system. The Office Action further contends that the use of blood flow as a feedback parameter to control the output of the RF generator would be an obvious consideration for one of ordinary skill in the art because Jain teaches that it is known to monitor and use blood flow to control the output of an RF source.

As mentioned above, claim 1 recites selecting a value for an operating parameter for supplying energy to the ablation electrode as a function of first, second and third signals. The first signal represents a value of a blood flow rate and the third signal represents a value of a positive distance from an ablation electrode surface that is not in contact with tissue to a target tissue surface. Claim 1 has been amended to recite selecting a value for an operating parameter for supplying energy to the ablation electrode as a function of the first, second and third signals to produce a lesion having a lesion size.

Zhang does not teach or suggest that distance and flow rate should both be used as inputs to control energy output insofar as lesion dimensions are concerned. In fact, Zhang explicitly teaches that when non-contact ablation is performed, there is no reason to consider blood flow rate in terms of lesion dimensions. In Zhang, the main conclusion of the article is that with non-contact ablation, flow rate does not cause noticeable differences for lesion formation (see page 221, Section C and page 222, lines 1-3). Zhang explicitly states that “With noncontact ablation, the delivered power remains constant during ablation time, which means that we can ignore the effect due to flow rate” (page 222, lines 9-11). Concisely stated, even if one of ordinary skill in the art were to use a value of a distance between an electrode and a tissue surface as part of selecting an operating parameter, Zhang teaches to one of ordinary skill in the art that values of blood flow rate can be ignored for purposes of lesion formation using noncontact ablation. Consequently, one of ordinary skill in the art would not be motivated to use blood flow rate as part of selecting an operating parameter.

While Jain may teach monitoring blood flow as part of controlling the output of an RF source, this teaching is made in the context of contact ablation. And while Jain does not explicitly state that the RF probe must be in contact with tissue, Jain contains no teaching or suggestion that

the RF probe may be spaced from a tissue surface. Accordingly, Jain does not teach or suggest that distance and flow rate should both be used as inputs to control energy output.

Because the only applied reference that teaches spacing an ablation electrode at a distance from a tissue surface also teaches that blood flow rate is of no consequence to the dimensions of lesion formation, one of ordinary skill in the art would not be motivated to modify Hoey to receive a first signal representing a value of a blood flow rate, receive a third signal representing a value of a positive distance from an ablation electrode surface that is not in contact with tissue to a target tissue surface, and select a value for an operating parameter for supplying energy to the ablation electrode as a function of the first and third signals to form a lesion having a lesion size.

Accordingly, withdrawal of the rejection of claim 1 is respectfully requested.

Each of dependent claims 2-4, 7-10, 12, 14-16, 20, 23-25, 27 and 30 depends either directly or indirectly from claim 1, and withdrawal of the rejection of these claims is respectfully requested for at least the same reasons presented above for claim 1.

CONCLUSION

Applicant believes the pending application is in condition for allowance and a Notice of Allowance is respectfully requested. If the Examiner believes that minor clarifying amendments to the claim would be helpful, the Examiner is requested to call the undersigned at the telephone number listed below.

In the event the U.S. Patent and Trademark Office determines that an extension is required, applicant petitions for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees, not already included, due in connection with the filing of this document to our Deposit Account No. 23/2825 under Docket No. B1075.71016US01 from which the undersigned is authorized to draw.

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Respectfully submitted,

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